



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/792,216	03/04/2004	Robert J. Nechvatal	011351.52875US	4152
23911	7590	09/24/2007		
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			EXAMINER NGUYEN, XUAN LAN T	
			ART UNIT 3683	PAPER NUMBER
			MAIL DATE 09/24/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/792,216

Applicant(s)

NECHVATAL ET AL.

Examiner

Lan Nguyen

Art Unit

3683

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 4, 6-8, 11, 13, 14, 16, 17, 19, 21, 22, 24-26 and 28 is/are pending in the application.
- 4a) Of the above claim(s) 29-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 1, 3, 4, 6-8, 11, 13, 14, 16, 17, 19, 21, 22, 24-26 and 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Drawings***

2. The drawings are objected to because they appear to be informal drawings. Figures 1, 2 and 4 are faint and hard to see. Figure 3 is blackened and is very hard to see. Please submit formal drawings in response to this office action.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the bracket/ torque plate attaching the sensor and the caliper to the axle as claimed in claims 11 and 28 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 4, 6-8, 11, 13, 14, 16, 17, 19, 21, 22, 24-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davy (US 4061213) in view of Pauwels et al. (US Re. 29509).

Re: claim 1, Davy shows a sensor arrangement, as in the present invention, comprising: a wheel speed sensor 22; and a sensor exciter 20, wherein the sensor exciter is located on a rotor of 10 the air disc brake, adjacent to a junction of a friction portion 18 of the brake rotor and a neck portion 16 of the brake rotor, on an extension of the neck portion of the brake rotor which extends axially from the junction of the friction portion and the neck portion toward a longitudinal center of the vehicle axle; the sensor is disposed adjacent to the exciter, such that the sensor is arranged to detect exciter motion, as shown in figure 1. Davy shows the friction portion 18 to be a solid member while claim 1 requires an air gap. Pauwels teaches a disc brake with a ventilated rotor 28; wherein there is an air gap between the junction of the friction portion 28 and the neck portion 20 toward a longitudinal center of the vehicle axle, and at least a portion of the friction portion facing the shield 68. Note that Pauwels also places the exciter 42 at the junction. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the ventilated disk as taught by Pauwels in the

Art Unit: 3683

arrangement of Davy in order to take advantage of better heat exhaustion for the brake system which would improve the performance of the brake system as well and prolonging it.

Re: claims 3, 4, 6, 7, 8 and 13, Davy shows the exciter to be integral with the rotor while Pauwels shows the exciter to be a separate ring being attached to the rotor. These are well known ways of incorporating exciters into the brake system. Both Davy and Pauwels show the sensor is located closer to a longitudinal center of the vehicle axle than a neck portion of the brake rotor. Davy shows that the sensor is for anti locking.

Re: claim 11, Pauwels further shows the sensor 100 is located on a bracket 10, which attaches a caliper 65 of the air disc brake to the vehicle axle 12.

Re: claim 14, Davy shows vehicle axle assembly with a disc brake and a sensor arrangement, as in the present invention, comprising: a vehicle axle 14; a disk brake 18 located adjacent to a hub 13 end of the vehicle axle; a wheel speed sensor 22; and a sensor exciter 20, wherein the sensor exciter is located on a rotor 18 of the disc brake, adjacent to a junction of a friction portion of the brake rotor and a neck portion of the brake rotor, on an extension of the neck portion of the brake rotor which extends axially from the junction of the friction portion and the neck portion toward a longitudinal center of the vehicle axle as shown; and the sensor is disposed on the vehicle axle adjacent to the exciter, such that the sensor is arranged to detect exciter motion. Davy shows the friction portion 18 to be a solid member while claim 1 requires an air gap. Pauwels teaches a disc brake with a ventilated rotor 28; wherein there is an air gap between the

Art Unit: 3683

junction of the friction portion 28 and the neck portion 20 toward a longitudinal center of the vehicle axle, and at least a portion of the friction portion facing the shield 68. Note that Pauwels also places the exciter 42 at the junction. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the ventilated disk as taught by Pauwels in the arrangement of Davy in order to take advantage of better heat exhaustion for the brake system which would improve the performance of the brake system as well and prolonging it. Please note Applicant's admittance to the air disc brake system as stated in the Final Rejection dated 4/11/07, paragraph 6.

Re: claims 16 and 17, Davy shows the exciter to be integral with the rotor while Pauwels shows the exciter to be a separate ring being attached to the rotor. These are well known ways of incorporating exciters into the brake system. Both Davy and Pauwels show the sensor is located closer to a longitudinal center of the vehicle axle than a neck portion of the brake rotor.

Re: claim 19, Davy shows a sensor exciter for use with a vehicle axle equipped with a disc brake, as in the present invention, comprising: a sensor exciter 20 configured to generate an electrical signal in a wheel speed sensor 22 affixed to the vehicle axle 14, wherein the sensor exciter is adapted to be located on a rotor 18 of the disc brake in a position adjacent to the wheel speed sensor and adjacent to a junction of a friction portion of the brake rotor and a neck portion of the brake rotor, on an extension of the neck portion of the brake rotor which extends axially from the junction of the friction portion and the neck portion toward a longitudinal center of the vehicle

Art Unit: 3683

axle. Davy shows the friction portion 18 to be a solid member while claim 1 requires an air gap. Pauwels teaches a disc brake with a ventilated rotor 28; wherein there is an air gap between the junction of the friction portion 28 and the neck portion 20 toward a longitudinal center of the vehicle axle, and at least a portion of the friction portion facing the shield 68. Note that Pauwels also places the exciter 42 at the junction. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the ventilated disk as taught by Pauwels in the arrangement of Davy in order to take advantage of better heat exhaustion for the brake system which would improve the performance of the brake system as well and prolonging it. Please note Applicant's admittance to the air disc brake system as stated in the Final Rejection dated 4/11/07, paragraph 6.

Re: claims 21 and 22, Davy shows the exciter to be integral with the rotor while Pauwels shows the exciter to be a separate ring being attached to the rotor. These are well known ways of incorporating exciters into the brake system. Both Davy and Pauwels show the sensor is located closer to a longitudinal center of the vehicle axle than a neck portion of the brake rotor.

Re: claim 24, Davy shows a brake rotor, as in the present invention, comprising: a brake disc 18 including a friction portion 18 and a neck portion 16, wherein a sensor exciter 20 configured to generate an electrical signal in a wheel speed sensor 22 is located on the brake disc in a position adjacent to a junction of a friction portion of the brake rotor and a neck portion of the brake rotor, on an extension of the neck portion of the brake rotor which extends axially from the junction of the friction portion and the



neck portion toward a longitudinal center of the vehicle axle. Davy shows the friction portion 18 to be a solid member while claim 1 requires an air gap. Pauwels teaches a disc brake with a ventilated rotor 28; wherein there is an air gap between the junction of the friction portion 28 and the neck portion 20 toward a longitudinal center of the vehicle axle, and at least a portion of the friction portion facing the shield 68. Note that Pauwels also places the exciter 42 at the junction. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the ventilated disk as taught by Pauwels in the arrangement of Davy in order to take advantage of better heat exhaustion for the brake system which would improve the performance of the brake system as well and prolonging it.

Re: claims 25 and 26, Davy shows the exciter to be integral with the rotor while Pauwels shows the exciter to be a separate ring being attached to the rotor. These are well known ways of incorporating exciters into the brake system. Both Davy and Pauwels show the sensor is located closer to a longitudinal center of the vehicle axle than a neck portion of the brake rotor.

Re: claim 28, Davy shows a sensor mounting arrangement for use on a vehicle axle equipped with a disc brake, as in the present invention, comprising: a wheel speed sensor 22; and a sensor exciter-detecting portion of the sensor is located at a position corresponding to a location of a sensor exciter 20 arranged on a brake rotor 18 of the disc brake in a position adjacent to a junction of a friction portion 18 of the brake rotor and a neck portion 16 of the brake rotor and on an extension of the neck portion of the brake rotor which extends axially from the junction of the friction portion and the neck

Art Unit: 3683

portion toward a longitudinal center of the vehicle axle. Davy shows the friction portion 18 to be a solid member while claim 1 requires an air gap. Pauwels teaches a disc brake with a ventilated rotor 28; wherein there is an air gap between the junction of the friction portion 28 and the neck portion 20 toward a longitudinal center of the vehicle axle, and at least a portion of the friction portion facing the shield 68. Note that Pauwels also places the exciter 42 at the junction. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the ventilated disk as taught by Pauwels in the arrangement of Davy in order to take advantage of better heat exhaustion for the brake system which would improve the performance of the brake system as well and prolonging it. Please note Applicant's admittance to the air disc brake system as stated in the Final Rejection dated 4/11/07, paragraph 6. Pauwels further shows and a torque plate 10 for fixing a caliper 65 of the disc brake to the vehicle axle 12, wherein the sensor 100 is held by the torque plate 10 between a brake caliper mounting portion of the torque plate 64 and a vehicle axle 12 attachment portion of the torque plate 10, as shown in figures 1 and 2.

### ***Response to Arguments***

7. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Antony et al. is cited for another exciter ring.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Nguyen whose telephone number is (571) 272-7121. The examiner can normally be reached on Monday through Friday, 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Xuan Lan Nguyen/ 9-18-07  
Primary Examiner  
Art Unit 3683